02-5-2015

State of Louisiana
Department of Transportation and Development (DOTD)
Materials and Testing Section Qualification Procedure

CONCRETE ANCHOR SYSTEMS

MATERIAL SPECIFICATION REFERENCE:

DOTD Standard Specifications, Supplemental Specifications and Special Provisions, Subsection 1018.22 (copy attached). For anchoring application, the epoxy shall comply with ASTM C 881 (with the exception of the gel time requirement) and ICC-ES AC 308. The epoxy must be evaluated by AASHTO NTPEP (address listed below.)

PRELIMINARY REQUIREMENTS:

Approved Materials Evaluation Form

The manufacturer shall submit a standard "Approved Materials Evaluation Form" to the DOTD Materials and Testing Section Coordinator listed below for each system to be evaluated, along with a letter requesting evaluation for the Approved Materials List.

Material Data Sheets

A material data sheet for each system shall also be submitted showing the manufacturer's specifications, anchoring instructions, available sizes, embedment depths (if applicable), ultimate pull-out and shear test results of anchors installed in 4,000 psi (27.58 MPa) concrete, material limitations (such as hole diameter tolerances, moisture limitations, etc.), and Materials Safety Data Sheet (MSDS).

Samples (to be furnished at no cost to the Department)

Submit for each system three ½ in. (three 13 mm) diameter anchors and three 3/4 in.(three 19.05 mm) diameter anchors to be embedded in hardened concrete in accordance with the manufacturer's written instructions for pull-out tests. For systems which include the anchor bolt, an additional sample of the 1/2 and 3/4 inch (13 and 19.05 mm) bolts will be required so that the tensile and coating properties can be determined.

Concrete Blocks

The manufacture shall provide concrete slabs with the following requirements:

1. Must have a minimum compressive strength of 4,000 psi. This shall be verified by at least two 6" x 12" or three 4"x8" concrete cylinders per mix.
2. Must be located locally with access to electricity and air compressor.
3. Must have adequate surface area and depth to perform the pull-out tests.
4. Cost and disposal of the concrete slabs will be borne by the manufacturer.

Special Tools: The manufacturer will provide the special tools needed for the evaluation.

For anchor systems using epoxy, the epoxy must be evaluated by AASHTO NTPEP. The manufacturer must contact AASHTO NTPEP Coordinator at the address below:

NTPEP Coordinator
AASHTO National Transportation Products Evaluation Program
444 N. Capitol St. N.W.
Suite 249
Washington, D.C. 20001
Phone: (202) 624-3695
Fax: (202) 624-5806
http://data.ntpep.org

TEST REQUIREMENTS:

Laboratory Testing

A full size 1/2 in. and 3/4 in. (13 mm and 19.05 mm) bolt will be tested for tensile and coating properties. In addition, test specimens will be anchored in concrete in accordance with the manufacturer's instructions so that pull-out tests can be conducted to verify the manufacturer's ultimate pull-out strength data. The manufacturer's representative shall be present during the evaluation of anchors to ensure proper installation and handling of the material. Prior to the evaluation, special adaptors or other tools which may be required for the installation shall be supplied to the Materials Section Coordinator.

Alternate Testing

As an alternate to the above Laboratory Testing, a manufacturer may elect to choose a private, local laboratory or ready mix plant to perform the preliminary tests required by the Department. The manufacturer representative is responsible for the installation of the anchor system, hydraulic jack calibration, and must submit the schedule and pertinent information to DOTD Coordinator for review. The DOTD Coordinator or his appointee will schedule the date and time to be present to witness the installation operation. The following procedures apply to the evaluation of the anchor systems.

All anchors will be tested for pull-out resistance individually. A loading frame will be placed directly over the installed anchor such that a tensile pull-out load can be applied to the anchor with the aid of a hydraulic jack. The ultimate load carried by each anchor will be reported as well as the mode of failure. The mode of failure may occur by one or a combination of the following:

1. Failure of the concrete test slab
2. Bond failure between the anchor and test slab
3. The yielding or fracture of any component of the anchor system

Acceptance of the anchor system will be subject to the following:

1. Conformance of the anchor bolt tensile and coating properties with the manufacturer's specifications.
2. Conformance of the Materials and Testing Section's pull-out tests with a minimum of 90% of the manufacturer's ultimate pull-out results for 1/2 inch and 3/4 inch (13 and 19.05 mm) anchors installed in 4,000 psi (27.58 MPa) concrete.

During the pull-out tests, failure of the concrete test slab at loads less than 90% of the manufacturer's ultimate strengths will render the test invalid, and the results will be discarded. If, for either the 1/2" or 3/4" (13 and 19.05 mm) anchor size, all three pull-out tests are invalid, then a retest will be allowed consisting of three additional pull-out tests per size.

The yielding or fracture of any component of the anchor system or failure of the bond between the anchor and test slab will be considered a valid test, regardless of the pull-out loads obtained. Failure of either the 1/2" or 3/4" (13 and 19.05 mm) anchors to conform with the above will result in rejection of the system.

Evaluation Time

Laboratory Testing - 1 month

GENERAL:

Upon completion of the evaluation, the submitter will be notified in writing concerning the results of the evaluation and whether the material will or will not be added to the Approved Materials List. If a material is to be added to the Approved Materials List, the working loads, calculated as 25% of the manufacturer's ultimate pull-out and shear results, will be listed for each size anchor and corresponding embedment depths. The Department reserves the right to reevaluate any approved material at any time.

PROJECT ACCEPTANCE REQUIREMENTS:

Qualification of a material is not blanket approval for its use. A sample of each system shipped to a project will be sampled by Department personnel prior to use in accordance with the Department's Materials Sampling Manual. These samples will be tested for conformance with contract specifications regardless of prior approval.

DISQUALIFICATION:

Any material may be removed from the Approved Materials List for non-conformance with specifications and unsatisfactory field performance. The Department must be notified in writing of any name change or change in material formulation. Significant changes may require reevaluation of the material.

REQUALIFICATION:

A material which has been disqualified and removed from the Approved Materials List will be considered for reevaluation only after submission of a formal request along with acceptable evidence that the problems causing the disqualification have been resolved.

DOTD MATERIALS AND TESTING SECTION COORDINATOR

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